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DEPARTMENT OF STATE

22 CFR Part 121

RIN 1400-AD25

[Public Notice 8775]

Amendment to the International Traffic in Arms Regulations: United States Munitions List Category XI (Military Electronics), and Other Changes

AGENCY: Department of State.

ACTION: Final rule.

SUMMARY: As part of the President's Export Control Reform (ECR) effort, the Department of State is amending the International Traffic in Arms Regulations (ITAR) to revise U.S. Munitions List (USML) Category XI (Military Electronics). The Department is also amending Category VIII (Aircraft and Related Articles) with respect to wing folding systems and both Categories VIII and XIX to remove three paragraphs superseded by the revision of Category XI. The revisions contained in this rule are part of the Department of State's retrospective plan under E.O. 13563.

DATES: This rule is effective on December 30, 2014, except for to the revision to §121.1, Category VIII(h)(4), which is effective [insert date 45 days after date of publication in the *Federal Register*].

FOR FURTHER INFORMATION CONTACT: Mr. C. Edward Peartree, Director, Office of Defense Trade Controls Policy, Department of State, telephone (202) 663-2792; e-mail DDTCResponseTeam@state.gov. ATTN: Regulatory Change, USML Category XI Final Rule. The Department of State's full retrospective plan can be accessed at

<http://www.state.gov/documents/organization/181028.pdf>.

SUPPLEMENTARY INFORMATION: The Directorate of Defense Trade Controls (DDTC), U.S. Department of State, administers the International Traffic in Arms Regulations (ITAR) (22 CFR parts 120-130). The items subject to the jurisdiction of the ITAR, (*i.e.*, “defense articles” and “defense services”) are identified on the ITAR’s U.S. Munitions List (USML) (22 CFR 121.1). With few exceptions, items not subject to the export control jurisdiction of the ITAR are subject to the jurisdiction of the Export Administration Regulations (“EAR,” 15 CFR parts 730-774, which includes the Commerce Control List (CCL) in Supplement No. 1 to part 774), administered by the Bureau of Industry and Security (BIS), U.S. Department of Commerce. Both the ITAR and the EAR impose license requirements on the export, reexport, and retransfer of commodities, software, technology, and services to various destinations, end users, and end uses. Items not subject to the ITAR or to the exclusive licensing jurisdiction of any other set of regulations are subject to the EAR.

All references to the USML in this rule are to the list of defense articles controlled for the purpose of export or temporary import pursuant to the ITAR, and not to the defense articles on the USML that are controlled by the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) for the purpose of permanent import under its regulations. *See* 27 CFR part 447. Pursuant to section 38(a)(1) of the Arms Export Control Act (AECA), all defense articles controlled for export or import are part of the USML under the AECA. For the sake of clarity, the list of defense articles controlled by ATF for the purpose of permanent import is the U.S. Munitions Import List (USMIL). The transfer of defense articles from the ITAR’s USML to the EAR’s CCL for the purpose of export control does not affect the list of

defense articles controlled on the USMIL under the AECA for the purpose of permanent import.

Export Control Reform Update

Pursuant to the President's Export Control Reform (ECR) initiative, the Department has published proposed revisions to thirteen USML categories – and, upon the effective date of this rule, will have revised fifteen USML categories – to create a more positive control list and eliminate, where possible, “catch all” controls in the USML. The Department, along with the Departments of Commerce and Defense, reviewed the public comments the Department received on the proposed rules and has, where appropriate, revised the rules. A discussion of the comments relevant to the USML categories that are part of this rule is included later on in this notice.

Discussions of the public comments relevant to the other USML categories that have been published as final rules are in “Amendment to the International Traffic in Arms Regulations: Initial Implementation of Export Control Reform,” published April 16, 2013 (78 FR 22740); “Amendment to the International Traffic in Arms Regulations: Continued Implementation of Export Control Reform,” published July 8, 2013 (78 FR 40922); “Amendment to the International Traffic in Arms Regulations: Third Rule Implementing Export Control Reform,” published January 2, 2014 (79 FR 34); and “Amendment to the International Traffic in Arms Regulations: Revision of U.S. Munitions List Category XV,” published May 13, 2014 (79 FR 27180). These notices also contain policies and procedures regarding the licensing of items moving from the export jurisdiction of the Department of State to the Department of Commerce, a definition for specially designed, responses to public comments, and changes to other sections of the ITAR

that affect the categories discussed in this rule. The Department continues to review the remaining USML categories and will publish them as proposed rules in the coming months.

Pursuant to ECR, the Department of Commerce has been publishing revisions to the EAR, including various revisions to the CCL. Revision of the USML and CCL are coordinated so there is uninterrupted regulatory coverage for items moving from the jurisdiction of the Department of State to that of the Department of Commerce. The Department of Commerce's companion to this rule is "Revisions to the Export Administration Regulations (EAR): Control of Military Electronic Equipment and Related Items the President Determines No Longer Warrant Control Under the United States Munitions List (USML)." It is published elsewhere in this edition of the *Federal Register*.

Changes in this Rule

The following changes are made to the ITAR with this final rule: (i) revision of U.S. Munitions List (USML) Categories XI (Military Electronics); (ii) revision to USML Category VIII (Aircraft and Related Articles), paragraph (h)(4); (iii) continued implementation of a new licensing procedure for the export of items subject to the EAR that are to be exported with defense articles; and (iv) removal of USML Category VIII, paragraphs (h)(21) and (h)(22) and USML Category XIX (Gas Turbine Engines and Associated Equipment), paragraph (f)(7), as they are superseded by USML Category XI, paragraphs (c)(2), (c)(3), and (c)(11).

Revision of USML Category XI

This final rule revises USML Category XI, covering military electronics, to describe more precisely the articles warranting control on the USML.

Paragraph (a) is revised by adding various subparagraphs to specifically enumerate the articles controlled. Subparagraph (a)(6) is removed and placed in reserve, with the computers intended for control enumerated in new paragraph (c)(16). Paragraphs (a)(9)-(12) are added to cover (i) electronic sensor systems or equipment for non-acoustic antisubmarine warfare (ASW) or mine warfare, (ii) electronic sensor systems or equipment for detection of concealed weapons, (iii) test sets specially designed for testing defense articles controlled in paragraphs (a)(3), (a)(4), (a)(5), or (b), and (iv) direction finding equipment specially designed for articles in select paragraphs of USML Categories IV and VIII.

Paragraph (c) is amended by adding subparagraphs (1)-(18) to specifically enumerate the parts, components, accessories, attachments, and associated equipment controlled. Additionally, subparagraph (19) is added to enumerate control of classified technology.

Finally, paragraph (x) is added to allow for ITAR licensing of commodities, software, and technology subject to the EAR provided those commodities, software, and technology are to be used in or with defense articles controlled in USML Category XI *and* are described in the purchase documentation submitted with the application. As first described in the Department's April 16, 2013 notice (78 FR 22740), one of the objectives of this provision is to motivate exporters to make complete jurisdictional and classification determinations of the articles they are exporting.

The Department published proposed revisions to USML Category XI on November 28, 2012 (*see* 77 FR 70958, RIN 1400-AD25) and July 25, 2013 (*see* 78 FR 45018, RIN 1400-AD25). Both proposed rules requested public comment on the proposed changes. The public comments were reviewed and considered by the Department and other agencies. The

Department's evaluation of the written comments and recommendations for the first proposed rule are in the second proposed rule. The Department's evaluation of the written comments and recommendations for the second proposed rule follows.

The Department received proposals for modifications to the phrasing of regulatory text in USML Category XI. When the recommended changes added to the clarity of the regulation and were consistent with ECR objectives, the Department accepted them.

One commenting party suggested that a separate sub-paragraph should be added for software and software source code for the development, operation, test, and repair of articles enumerated in Category XI. The Department believes that these articles are already captured in paragraph XI(d), and therefore did not accept this recommendation.

One commenting party suggested that phrases such as "having all of the following" should be avoided. The Department did not accept this suggestion because the phrase is necessary to create, where possible, positive control lists, which is one of the objectives of Export Control Reform effort.

One commenting party highlighted a circular reference between paragraphs (a)(1) and (c). Paragraph (a)(5)(i) refers to items "that are specially designed to integrate, incorporate, network, or employ defense articles that are controlled in this subchapter." Paragraph (c) lists components that are specially designed for defense articles. The commenter asserts that this dual reference to "specially designed" in both places creates a logical paradox. For example, a system could possibly fall under paragraph (a)(5) because it is specially designed to integrate, incorporate, network, or employ defense articles controlled under paragraph (c)(1), (2),

and (3). However, for paragraph (c)(1), (2), and (3) parts to be ITAR-controlled, they must be “designed for defense articles in this subchapter,” which logically loops back to paragraph (a)(5). The commenter suggests that paragraph (c) be treated independently of other USML Category XI subparagraphs in line with the concept of creating a positive list, and that the circular reference to "specially designed" in both paragraphs (a)(5) and (c) be resolved. The Department agrees in part and adds the phrase, “that are controlled in sub-paragraphs that do not use the term specially designed,” at the end of paragraph (a)(5)(i) to resolve the circular reference issue.

One commenting party suggested that USML Category XI should be reviewed periodically to ensure the most critical articles are controlled and that a committee of industry representatives should be created to provide input. The Department agrees that the USML, including Category XI, should be reviewed periodically to ensure that articles critical to national security and foreign policy are captured and that articles no longer warranting ITAR controls are reevaluated for possible control by the Department of Commerce. The exact details of such a reevaluation process have yet to be articulated. However, the Departments of State, Commerce, and Defense have committed to ensuring such efforts are a priority.

One commenting party suggested that the Department should factor in foreign commercial availability when determining the appropriate level of control for an article. The Department did take foreign availability of like military systems into account when revising this category, but not in a manner that would be inconsistent with U.S. national security or foreign policy considerations. To the extent an item is commercially available and in normal commercial use, either domestically or outside the United States, the Department requested evidence of such applications, because it was not

the Department's intention to describe in the revised USML Category XI items that are in normal commercial use unless such items provided to the United States a critical military or intelligence advantage. This final rule responds to all such evidence provided by public commenters.

One commenting party suggested that paragraph (a)(1)(i) be revised to ensure that all multi-element sensing systems, especially Ultra Short Baseline systems, are not inadvertently captured because this would preclude commercial development of collision avoidance for unmanned surface and subsurface vehicles. The party also suggested revising this paragraph to remove the terms "survey," "detect," "classify," and "identify." The Department did not accept these suggestions because the Department's objective is to specifically describe and control such articles on the USML.

Regarding paragraph (a)(1)(i), one commenting party noted that passive towed array systems exist for tracking and classifying marine mammals in real time that operate under 20 kHz with greater than 10 kHz bandwidth. These systems are "capable" of tracking vessels (and do). The commenter recommended that the phrase "capable of real-time" be replaced by "intended for real-time." The Department acknowledges this assertion as accurate; however, the control capability described in the revised paragraph is critical to U.S. national security and continues to warrant ITAR controls.

One commenting party noted that paragraph (a)(1)(ii) appears to include commodities currently controlled on the CCL, namely 6A001.a.2.a-c (hydrophones, hydrophone arrays, and related processing equipment), related software in 6D003, and the commodities currently described in ECCN 6A991. The Department amended paragraph (a)(1)(ii) by adding the qualifier phrase "non-biologic" before "tonals."

One commenting party asserts that paragraph (a)(1)(ii) identifies “underwater single acoustic sensor systems that distinguish tonals and locates the origin of the sound” without providing technical parameters to establish a reasonable threshold to warrant their inclusion on the USML, and recommends that if there are no clear technical parameters or performance thresholds that differentiate between systems, perhaps the unique characteristics of military “tonals” should be subject to control rather than the sensing technology. The Department acknowledges the potential for confusion in this regard and added Note 1 to paragraph (a)(1)(ii) to read as follows: “The term tonals implies discrete frequencies in the broadband and narrowband spectra, emanating from man-made objects.”

One commenting party opined that use of the term “origin” in (a)(1)(ii) is confusing because it can be interpreted to mean either “classify” or “localize.” The Department believes that the qualifying term “locates” makes clear that “origin” refers to a spatial origin rather than the classification status of an item.

One commenting party recommend removing “adaptive modulation” from paragraph (a)(1)(iv) since it is a major source of academic research and development for research universities worldwide and the United States is not a leader in the field. The Department did not accept this recommendation because no examples of such commercial uses were provided for evaluation.

One commenting party suggested that the note to paragraph (a)(1)(iii) leaves open the possibility that EAR99 items would become controlled by the ITAR. The Department agrees that the note as written suggested this possibility, and removed the note to paragraph (a)(1)(iii).

With respect to paragraph (a)(1)(vii), one commenting party suggested that the capabilities regarding “ 1m^2 +RCS at range and altitude”

already exist in the legacy National Airspace System and recommended that these criteria be removed. The Department did not accept this suggestion because radar with this capability are still highly capable for defense purposes and warrant ITAR control.

One commenting party opined that the articles listed in paragraph (a)(2) fall into a highly competitive foreign market, and should be more appropriately controlled in the 600-series, even though their primary use is military. The Department did not accept this recommendation because underwater acoustic countermeasures and counter-countermeasures systems are a critical U.S. military capability. Moreover, no examples of commercial end-uses for such items were provided.

With respect to paragraph (a)(2), one commenting party noted that the majority of torpedo countermeasure systems are unclassified mechanical and electrical equipment to deploy and retrieve a towed body, are not uniquely military, and that the only classified software and hardware should be controlled. The Department did not accept this suggestion because the text of this paragraph controls underwater acoustic countermeasures or counter-countermeasures systems, not their individual components.

Several commenting parties opined that radar systems that have historically been controlled on the CCL are now being controlled by the USML in paragraph (a)(3) as a result of this final rule. The Department does not agree with this assertion and notes that the very broad text of Category XI is being replaced with a more positive list. While it may appear that various radar technologies are being newly controlled on the USML, they have in fact always been controlled by the ITAR. The Department notes that any previously issued Commodity Jurisdiction determinations that a particular radar system or component is subject to the EAR remain valid.

One commenting party recommended the addition of a note to paragraph (a)(3) indicating that the identified technical parameters are intended to apply only to the designed capability of a system, rather than its potentially increased capability in altered environmental conditions. The Department did not accept this recommendation. The established thresholds in each paragraph are intended to apply to the optimal capability of a system in any given condition, not to that system's intended design capability.

One commenting party noted that there exist radars supporting en-route air traffic control that are capable of detecting a one square meter radar cross-section at ranges exceeding 85 nautical miles and recommended changing the threshold to one-half square meter or to a range of 150 nautical miles. The commenting party based this recommendation on a Commodity Classification Automated Tracking System (CCATS) determination issued by the Department of Commerce. The Department did not accept this recommendation and notes that the CCATS in questions applied to the frequency agility capability of the particular radar in question and not to the radar itself.

Two commenting parties asserted that paragraph (a)(3)(i) could be interpreted to cover weather radar because they too "maintain the positional state of an object of interest in a received radar signal through time." The commenting parties suggested the addition of the phrase "and which is 'specially designed' to have a range greater than 14 nautical miles for a 0dBsm target." The Department did not accept this suggestion because weather radars do not track discrete objects of interest.

One commenting party noted that paragraphs (a)(3)(vi)-(viii) identify specific detection ranges and radar cross section values that are consistent with the capabilities of aircraft tracking radars in use worldwide for

commercial aviation. The Department has revised paragraph (a)(3)(vi) to preclude the inadvertent capture of commercial systems and was unable to identify commercial systems that would be captured by paragraph (a)(3)(viii). With respect to paragraph (a)(3)(vii), the Department acknowledges this observation and notes that, due to critical national security concerns, its intent is specifically to controls systems with this capability as defense articles.

Two commenting parties asserted that bi-static radar is being developed for ground-based radar applications and suggest limiting the scope of paragraph (a)(3)(ix) to non-commercial products that have performance beyond the civil air traffic collision avoidance systems. The Department did not accept this suggestion because Note 3 to paragraph (a)(3) already addresses this issue.

With respect to paragraph (a)(3)(ix), one commenting party noted that there exist radar systems that support terminal air traffic control modified to mitigate the effects of wind turbines, and to help support Ground Based Sense and Avoid Unmanned Aerial Systems in National Airspace Operations. The commenting party suggested adding a revisit rate of greater than or equal to 1/3 Hz to address this concern. The Department did not accept this recommendation and notes that the Federal Aviation Administration has not yet defined requirements for UAS sense and avoid capabilities. The commenting party referred to a Commodity Jurisdiction determination that such technology is subject to the EAR. The commenter did not provide a copy of this determination or any other reference to it and has been unable to identify such a determination. The Department notes that Commodity Jurisdiction determinations finding that a particular article is subject to the EAR remain valid.

Two commenting parties asserted that paragraph (a)(3)(xii) over-controls weather radar by including commercial, electronically steerable weather radar that lack military functionality and provided recommended revisions to it. The Department acknowledges the parties' concerns and adds a note to paragraph (a)(3)(xii).

Three commenting parties noted that the criteria listed in paragraph (a)(3)(xii) would capture all multi-phased array radar regardless of end-use. The Department acknowledges that the intent of this paragraph is to control all such radar because they are critical to U.S. national security. The Department also notes that this paragraph does not capture defense articles and technical data that were not previously controlled by USML Category XI; rather, it merely enumerates such defense articles and technical data as controlled.

Four commenting parties noted that references to clutter filtering in paragraph (a)(3)(xvii) would control commercial weather radars. One of these parties suggested that increasing the control threshold from 50dB to 60dB would alleviate this concern. The Department concurs and accepts the recommended threshold increase.

In response to one commenting party's request for clarification on use of the phrase "specific platform type" in paragraph (a)(3)(xxi), the Department notes that the meaning of the word "type" in the paragraph controlling radar employing non-cooperative target recognition is that provided in 14 CFR §1.1, and adds Note 1 to paragraph (a)(3)(xxi) accordingly.

One commenting party suggested that the reference to "electronic combat equipment" in paragraph (a)(4) is too broad because it would control

items now subject to the EAR. The Department notes that the criteria in the following subparagraph already mitigate this concern.

One commenting party stated that paragraph (a)(4)(i) appears to control detection and interception systems and equipment that have historically been controlled on the CCL. The Department notes that ECCN 5A001.i only pertains to mobile telecommunication monitoring and that the control language in paragraph (a)(4)(i) does not encompass the intercept and processing of air interface of mobile telecommunications.

One commenting party noted that paragraph (a)(4)(iii) appears to include commodities currently controlled on the CCL, specifically ECCN 5A001.f. The Department notes that the use of “specially designed” in this entry specifically excludes this possibility.

One commenting party recommended adding the phrase "or modified" after specially designed throughout paragraph (a)(5) in order to address cases where capability, not design, is at issue. The Department did not accept this recommendation because capability is already covered in the definition of specially designed.

One commenting party suggested that paragraph (a)(7) appears to contradict one of the key purposes of export control reform, which is to provide a bright line regarding the export control jurisdiction of articles and services. The commenting party further indicated that the proposed revision does not define the criteria that will be used to determine a developmental electronic device or system to be a defense article. Similarly, three commenting parties posited that a system could be incorrectly determined to be ITAR-controlled solely because of its funding source. The Department did not accept these comments; notes 1 through 3 to paragraph (a)(7) clearly indicate the criteria to be applied in this regard, thus obviating concerns of

ambiguity. In situations where funding does control a particular article, the Department notes that this was precisely the intent of this entry. The Department notes that paragraph (a)(7) does not apply to electronic systems or equipment where the Department of Defense acts solely as a servicing agency for a contract on behalf of another agency of the U.S. Government, but does not itself contribute funding.

One commenting party opined that paragraph (a)(8) would control unattended ground systems currently controlled on the CCL, or widely-available commercial products that contain the capabilities enumerated, and suggested narrowing the scope of this entry by use of “specially designed.” The Department did not accept this suggestion because no examples were provided to substantiate this claim.

One commenting party noted that paragraph (a)(10) identifies electronic sensor systems and equipment for detection of concealed weapons having a standoff detection range of greater than 45m, which conflicts with ECCN 2A984 for concealed object detection equipment which includes a standoff distance of 100m. The Department acknowledges this conflict and provides additional exclusionary criteria for frequency range and spatial resolution to address it.

One commenting party noted that paragraph (a)(11) identifies test sets for counter remote-controlled improvised explosive devices and counter radio electronic warfare systems that are already controlled in paragraph (a)(4)(iii). The Department amended paragraph (a)(11) to remove these references.

One commenting party stated that the note to paragraph (b) lacks clarity regarding what constitutes “intelligence services.” Based on the interagency review of the comments to the proposed note to Category XI(b),

the Department concluded that the proposed note created more confusion regarding the scope of the Category XI(b) than it resolved. The Department has removed the note and has left the scope of the control the same. To the extent there are questions as to whether an item is within the scope of USML Category XI(b), ITAR §120.4 allows for the submission of a request for a commodity jurisdiction determination for such items.

Several commenting parties expressed concern with respect to control of spectrum analyzers in paragraph (b), particularly for those that are widely available on the foreign market and used for multiple commercial purposes, including Technical Surveillance Countermeasure (TSCM) services. The Department notes that the proposed revision to Category XI(b) did not propose new controls on spectrum analyzers. If a spectrum analyzer, or any other piece of electronic equipment, is specially designed for intelligence purposes and collects, surveys, monitors, or exploits the electromagnetic spectrum (regardless of transmission medium), or for counteracting such activities, then it is within the scope of USML Category XI(b). To the extent there are questions as to whether a particular item falls within the scope of this description, the exporter may submit a request for a commodity jurisdiction determination under ITAR §120.4.

One commenting party recommended adding a note to paragraph (b)(1) to indicate that it does not apply to direction finding equipment or systems specially designed for navigation applications. The Department did not accept this recommendation and believes that the parameters define the control for direction finding equipment sufficiently to differentiate from CCL control.

In response to recommendations and concerns of commenting parties, the Department has revised the controls for printed circuit boards and

patterned multichip modules, providing each with a separate subparagraph, and notes that jurisdiction of a printed circuit board or patterned multichip module should follow the jurisdiction of the specific item for which it is designed, as opposed to the jurisdiction of the overall system into which the article one layer up from the printed circuit board is ultimately incorporated.

One commenting party recommended adding a new, non-SME entry under paragraph (c) to enumerate control of chaff and flare rounds specially designed for the systems and equipment described in paragraph (a)(4)(iii), and parts and components therefor containing materials controlled in USML Category V. The Department accepted this recommendation, and added paragraph (c)(17) accordingly.

One commenting party recommended that the Department adopt the definition of “Application Specific Integrated Circuit” (ASIC) developed by the Joint Electron Device Engineering Council (JEDEC) Solid State Technology Association: “*An integrated circuit developed and produced for a specific application or function and for a single customer.*” The Department agreed in part, and added note to paragraph (c)(1) to define an ASIC. The Department does not agree that the term ASIC be limited to items produced for a single customer. Such language could lead to unintended drops in controls based on an order by a second customer. The Commerce Department has adopted the same definition in its rule being published in connection with this rule.

One commenting party noted that the proposed paragraph (c)(4) would inadvertently control transmit/receive modules or transmit modules of a certain size that contain either an electric or a mechanical phase shifter or phaser. The Department agreed with this comment and amended paragraph (c)(4) accordingly.

One commenting party suggested that paragraph (c)(5) controls capacitors in commercial use and recommended that they should be made subject to the EAR. The Department did not accept this recommendation on the basis that the discharge rate and energy life stipulated in the paragraph (c)(5) adequately differentiates those capacitors that warrant ITAR controls from those that are used commercially.

Two commenting parties suggested that paragraph (c)(8) lacks the critical parameter of latency time for digital radio-frequency memory (DRFM) systems. The Department agreed with these comments and amended paragraph (c)(8) to control those systems whose output signal is a translation of the input signal (*e.g.* changes in magnitude, time, frequency).

Three commenting parties indicated that paragraph (c)(10) as written would control items already controlled by ECCN 5A991.f, such as metamaterial surface scattering antennas designed for transmitting or receiving radio communications via a commercial operated fixed or mobile satellite service system. The Department agreed with these comments and revised paragraph (c)(10)(i) to control those antennas that employ four or more elements, electronically steer angular beams, independently steer angular nulls, create angular nulls with a null depth greater than 20 dB, and achieve a beam switching speed faster than 50 milliseconds. The Department notes that a suggestion to amend the beam switching speed to control only those faster than 1 millisecond was not accepted as the modification of the remainder of the entry addresses the expressed concerns.

One commenting party opined that use of the term “radar bands” in paragraph (c)(11)(ii) is too generic because any radio frequency can theoretically be used for radar application. The commenter recommended replacing “radar bands” with the phrase “frequency bands for radar

applications.” The Department accepted this recommendation and revised the paragraph accordingly.

One commenting party recommended adding the phrase “for active sonar systems” to the end of paragraph (c)(12)(i) to avoid situations where underwater projectors are used to observe responses of marine animals to underwater sound. The Department accepted the addition of this phrase, with the exception of the word “active,” because passive systems are also intended for control.

Four commenting parties noted that paragraph (c)(14) is overly broad and would control tuners covered by ECCN 3A002.c.4. One party recommended constraining this paragraph to tuners specially designed for systems and equipment in paragraphs (a)(4) and (b). One party recommended that paragraph (c)(14) be deleted in its entirety. Two commenting parties recommended the addition of parameters for operating frequency range and tuning time based on frequency step size to clarify the type of tuner component intended to be controlled. The Department revised paragraph (c)(14) to control tuners specially designed for systems and equipment in paragraphs (a)(4) and (b).

One commenting party suggested that paragraph (c)(15) conflicts with certain changes made to USML Category VIII, specifically with respect to unmanned aerial vehicles (UAVs), in that it would seem to include all unmanned aerial vehicles, military or civil, if they have a range equal to or greater than 300 km. The Department amended paragraph (c)(15) to indicate that it applies only to UAVs controlled by USML Category VIII.

One commenting party suggested that paragraph (c)(19)(ii) could be interpreted as controlling commercial computers simply because they contain classified information. The Department does not agree, and believes

the note to paragraph (c)(19)(ii) makes clear that it controls only those items that “store, process, or transmit classified software.” To further clarify this point, the Department amended the note to paragraph (c)(1)(ii) by adding a parenthetical reference to ITAR §121.8(f).

Change to Control of Wing Folding Systems in USML Category VIII and Other Changes in Category VIII and USML Category XIX

The Department revised paragraph (h)(4) of USML Category VIII to ensure that wing folding systems for commercial aircraft are not controlled as defense articles, while retaining those systems that warrant ITAR controls for foreign policy and national security. This change is made based on a public comment received on the revisions proposed to USML Category VIII (*see*, RINs 1400-AC96 and 1400-AD37).

The Department also removed paragraphs (h)(21) and (h)(22) in USML Category VIII and paragraph (f)(7) in USML Category XIX (Gas Turbine Engines and Associated Equipment), as they are superseded by paragraphs (c)(2), (c)(3), and (c)(11) in USML Category XI.

Adoption of Proposed Rules and Other Changes

Having reviewed and evaluated the comments and recommended changes for the USML Category XI proposed rule, the Department has determined that it will, and hereby does, adopt them, with changes and omission noted and other edits, and promulgates them in final form under this rule.

REGULATORY ANALYSIS AND NOTICES

Administrative Procedure Act

The Department of State is of the opinion that controlling the import and export of defense articles and services is a foreign affairs function of the United States Government and that rules implementing this function are

exempt from sections 553 (rulemaking) and 554 (adjudications) of the Administrative Procedure Act (APA). Although the Department is of the opinion that this rule is exempt from the rulemaking provisions of the APA, the Department has published parts of this rule in separate rulemaking actions as follows: an NPRM and final rule on Category VIII, 1400-AC96 and 1400-AD37, respectively; an NPRM and final rule on Category XIX, 1400-AC98 and 1400-AD37, respectively; and an NPRM and Supplemental NPRM on Category XI, 1400-AD25. The rulemakings had a 45- or 60-day provision for public comment, without prejudice to the determination that controlling the import and export of defense services is a foreign affairs function.

Regulatory Flexibility Act

Since the Department is of the opinion that this rule is exempt from the provisions of 5 U.S.C. 553, there is no requirement for an analysis under the Regulatory Flexibility Act.

Unfunded Mandates Reform Act of 1995

This rulemaking does not involve a mandate that will result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100 million or more in any year and it will not significantly or uniquely affect small governments. Therefore, no actions were deemed necessary under the provisions of the Unfunded Mandates Reform Act of 1995.

Small Business Regulatory Enforcement Fairness Act of 1996

For purposes of the Small Business Regulatory Enforcement Fairness Act of 1996 (the “Act”), a “major” rule is a rule that the Administrator of the OMB Office of Information and Regulatory Affairs finds has resulted or is likely to result in 1) an annual effect on the economy of \$100,000,000 or

more; 2) a major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions; or 3) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic and foreign markets.

The Department does not believe this rulemaking will have an annual effect on the economy of \$100,000,000 or more. Articles that are being removed from coverage in the U.S. Munitions List categories contained in this rule will still require licensing for export, but from the Department of Commerce. While the licensing regime of the Department of Commerce is more flexible than that of the Department of State, it is not expected that the change in jurisdiction of these articles will result in an export difference of \$100,000,000 or more.

The Department also does not believe that this rulemaking will result in a major increase in costs or prices for consumers, individual industries, federal, state, or local government agencies, or geographic regions, or have significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of United States-based enterprises to compete with foreign-based enterprises in domestic and foreign markets.

Executive Orders 12372 and 13132

This rulemaking will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 13132, it is determined that this rulemaking does not have sufficient federalism implications to require consultations or warrant the preparation of a

federalism summary impact statement. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities do not apply to this rulemaking.

Executive Orders 12866 and 13563

Executive Orders 12866 and 13563 direct agencies to assess costs and benefits of available regulatory alternatives and, if regulation is necessary, to select regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety effects, distributed impacts, and equity). These executive orders stress the importance of quantifying both costs and benefits, of reducing costs, of harmonizing rules, and of promoting flexibility. This rulemaking has been designated a “significant regulatory action,” although not economically significant, under section 3(f) of Executive Order 12866. Accordingly, this rule has been reviewed by the Office of Management and Budget (OMB).

Executive Order 12988

The Department of State has reviewed this rulemaking in light of sections 3(a) and 3(b)(2) of Executive Order 12988 to eliminate ambiguity, minimize litigation, establish clear legal standards, and reduce burden.

Executive Order 13175

The Department of State has determined that this rulemaking will not have tribal implications, will not impose substantial direct compliance costs on Indian tribal governments, and will not preempt tribal law. Accordingly, the requirements of Executive Order 13175 do not apply to this rulemaking.

Paperwork Reduction Act

Following is a listing of approved collections that will be affected by revision of the U.S. Munitions List (USML) and the Commerce Control List pursuant to the President’s Export Control Reform (ECR) initiative. This

final rule continues the implementation of ECR. The list of collections and the description of the manner in which they will be affected pertains to revision of the USML in its entirety, not only to the categories published in this rule. In accordance with the Paperwork Reduction Act, the Department of State will request comment on these collections from all interested persons. In particular, the Department will seek comment on changes to licensing burden based on implementation of regulatory changes pursuant to ECR, and on projected changes based on continued implementation of regulatory changes pursuant to ECR. The affected information collections are as follows:

- 1) Statement of Registration, DS-2032, OMB No. 1405-0002. The Department estimates that between 3,000 and 5,000 of currently-registered persons will not need to maintain registration following full revision of the USML. This would result in a burden reduction of between 6,000 and 10,000 hours annually, based on a revised time burden of two hours to complete a Statement of Registration.
- 2) Application/License for Permanent Export of Unclassified Defense Articles and Related Unclassified Technical Data, DSP-5, OMB No. 1405-0003. The Department estimates that there will be 35,000 fewer DSP-5 submissions annually following full revision of the USML. This would result in a burden reduction of 35,000 hours annually.
- 3) Application/License for Temporary Import of Unclassified Defense Articles, DSP-61, OMB No. 1405-0013. The Department estimates that there will be 200 fewer DSP-61 submissions annually following full revision of the USML. This would result in a burden reduction of 100 hours annually.

4) Application/License for Temporary Export of Unclassified Defense Articles, DSP-73, OMB No. 1405-0023. The Department estimates that there will be 800 fewer DSP-73 submissions annually following full revision of the USML. This would result in a burden reduction of 800 hours annually.

5) Application for Amendment to License for Export or Import of Classified or Unclassified Defense Articles and Related Technical Data, DSP-6, -62, -74, -119, OMB No. 1405-0092. The Department estimates that there will be 2,000 fewer amendment submissions annually following full revision of the USML. This would result in a burden reduction of 1,000 hours annually.

6) Request for Approval of Manufacturing License Agreements, Technical Assistance Agreements, and Other Agreements, DSP-5, OMB No. 1405-0093. The Department estimates that there will be 1,000 fewer agreement submissions annually following full revision of the USML. This would result in a burden reduction of 2,000 hours annually.

7) Maintenance of Records by Registrants, OMB No. 1405-0111. The requirement to actively maintain records pursuant to provisions of the International Traffic in Arms Regulations (ITAR) will decline commensurate with the drop in the number of persons who will be required to register with the Department pursuant to the ITAR. As stated above, the Department estimates that up to 5,000 of the currently-registered persons will not need to maintain registration following full revision of the USML. This would result in a burden reduction of 100,000 hours annually.

However, the ITAR does provide for the maintenance of records for a period of five years. Therefore, persons newly relieved of the requirement to register with the Department may still be required to maintain records.

8) Export Declaration of Defense Technical Data or Services, DS-4071, OMB No. 1405-0157. The Department estimates that there will be 2,000 fewer declaration submissions annually following full revision of the USML. This would result in a burden reduction of 1,000 hours annually.

List of Subjects in 22 CFR 121

Arms and munitions, Classified, Exports.

PART 121 – THE UNITED STATES MUNITIONS LIST

1. The authority citation for part 121 continues to read as follows:

Authority: Secs. 2, 38, and 71, Pub. L. 90–629, 90 Stat. 744 (22 U.S.C. 2752, 2778, 2797); 22 U.S.C. 2651a; Pub. L. 105–261, 112 Stat. 1920; Section 1261, Pub. L. 112-239; E.O. 13637, 78 FR 16129.

2. Section 121 is amended:

- a. In Category VIII by revising paragraph (h)(4) and removing and reserving paragraphs (h)(21) and (22);
- b. By revising Category XI ; and
- c. In Category XIX by removing and reserving paragraph (f)(7).

The revisions read as follows:

§121.1 General. The United States Munitions List.

* * * * *

Category VIII— Aircraft and Related Articles

* * * * *

(h) * * *

(4) Wing folding systems, and specially designed parts and components therefor, for:

(i) Aircraft powered by power plants controlled under USML Category IV(d); or,

(ii) Aircraft powered by gas turbine engines with any of the following characteristics:

- (A) The portion of the wing outboard of the wing fold is required for sustained flight;
- (B) Fuel can be stored outboard of the wing fold;
- (C) Control surfaces are outboard of the wing fold;
- (D) Hard points are outboard of the wing fold;
- (E) Hard points inboard of the wing fold are capable of in-flight ejection; or
- (F) The aircraft is designed to withstand maximum vertical maneuvering accelerations greater than +3.5g/-1.5g.

* * * * *

(21) [Reserved]

(22) [Reserved]

* * * * *

Category XI— Military Electronics

(a) Electronic equipment and systems not included in Category XII of the U.S. Munitions List, as follows:

* (1) Underwater hardware, equipment, or systems, as follows:

(i) Active or passive acoustic array sensing systems or acoustic array equipment capable of real-time processing that survey or detect, and also track, localize (*i.e.*, determine range and bearing), classify, or identify, surface vessels, submarines, other undersea vehicles, torpedoes, or mines, having any of the following:

- (A) Multi-static capability;
- (B) Operating frequency less than 20 kHz; or
- (C) Operating bandwidth greater than 10 kHz;

(ii) Underwater single acoustic sensor system that distinguishes non-biologic tonals and locates the origin of the sound;

Note to paragraph(a)(1)(ii): The term tonals implies discrete frequencies in the broadband and narrowband spectra, emanating from man-made objects.

(iii) Non-acoustic systems that survey or detect, and also track, localize (*i.e.*, determine range and bearing), classify, or identify, surface vessels, submarines, other undersea vehicles, torpedoes, or mines;

(iv) Acoustic modems, networks, and communications equipment with real-time adaptive compensation or employing Low Probability of Intercept (LPI);

Note to paragraph (a)(1)(iv): Adaptive compensation is the capability of an underwater modem to assess the water conditions to select the best algorithm to receive and transmit data.

(v) Low Frequency/Very Low Frequency (LF/VLF) electronic modems, routers, interfaces, and communications equipment, specially designed for submarine communications; or

(vi) Autonomous systems and equipment that enable cooperative sensing and engagement by fixed (bottom mounted/seabed) or mobile Autonomous Underwater Vehicles (AUVs);

*(2) Underwater acoustic countermeasures or counter-countermeasures systems or equipment;

*(3) Radar systems and equipment, as follows:

(i) Airborne radar that maintains positional state of an object or objects of interest, other than weather phenomena, in a received radar signal through time;

(ii) Synthetic Aperture Radar (SAR) incorporating image resolution less than (better than) 0.3 m, or incorporating Coherent Change Detection (CCD) with

geo-registration accuracy less than (better than) 0.3 m, not including concealed object detection equipment operating in the frequency range from 30 GHz to 3,000 GHz and having a spatial resolution of 0.5 milliradians up to and including 1 milliradians at a standoff distance of 100 m;

(iii) Inverse Synthetic Aperture Radar (ISAR);

(iv) Radar that geodetically-locates (*i.e.*, geodetic latitude, geodetic longitude, and geodetic height) with a target location error 50 (TLE50) less than or equal to 10 m at ranges greater than 1 km;

(v) Any Ocean Surveillance Radar with an average-power-aperture product of greater than 50 Wm^2 ;

(vi) Any ocean surveillance radar that transmits a waveform with an instantaneous bandwidth greater than 100 MHz and has an antenna rotation rate greater than 60 Revolutions-per-Minute (RPM);

(vii) Air surveillance radar with free space detection of 1 square meter RCS target at 85 nmi or greater range, scaled to RCS values as RCS to the $1/4$ power;

(viii) Air surveillance radar with free space detection of 1 square meter RCS target at an altitude of 65,000 feet and an elevation angle greater than 20 degrees (*i.e.*, counter-battery);

(ix) Air surveillance radar with multiple elevation beams, phase or amplitude monopulse estimation, or 3D height-finding;

(x) Air surveillance radar with a beam solid angle less than or equal to 16 degrees^2 that performs free space tracking of 1 square meter RCS target at a range greater or equal to 25 nmi with revisit rate greater or equal to $1/3 \text{ Hz}$;

(xi) Instrumentation radar for anechoic test facility or outdoor range that maintains positional state of an object of interest in a received radar signal

through time or provides measurement of RCS of a static target less than or equal to minus 10dBsm, or RCS of a dynamic target;

(xii) Radar incorporating pulsed operation with electronics steering of transmit beam in elevation and azimuth;

Note to paragraph (a)(3)(xii): This paragraph does not control radars not otherwise controlled in this subchapter, operating with a peak transmit power less than or equal to 250 watts, and employing a design determined to be subject to the EAR via a commodity jurisdiction determination (*see* §120.4 of this subchapter).

(xiii) Radar with mode(s) for ballistic tracking or ballistic extrapolation to source of launch or impact point of articles controlled in USML Categories III or IV;

(xiv) Active protection radar and missile warning radar with mode(s) implemented for detection of incoming munitions;

(xv) Over the horizon high frequency sky-wave (ionosphere) radar;

(xvi) Radar that detects a moving object through a physical obstruction at distance greater than 0.2 m from the obstruction;

(xvii) Radar having moving target indicator (MTI) or pulse-Doppler processing where any single Doppler filter provides a normalized clutter attenuation of greater than 60dB;

Note to paragraph (a)(3)(xvii): “Normalized clutter attenuation” is defined as the reduction in the power level of received distributed clutter when normalized to the thermal noise level.

(xviii) Radar having electronic protection (EP) or electronic counter-countermeasures (ECCM) other than manual gain control, automatic gain control, radio frequency selection, constant false alarm rate, and pulse repetition interval jitter;

- (xix) Radar employing electronic attack (EA) mode(s) using the radar transmitter and antenna;
- (xx) Radar employing electronic support (ES) mode(s) (*i.e.*, the ability to use a radar system for ES purposes in one or more of the following: as a high-gain receiver, as a wide-bandwidth receiver, as a multi-beam receiver, or as part of a multi-point system);
- (xxi) Radar employing non-cooperative target recognition (NCTR) (*i.e.*, the ability to recognize a specific platform type without cooperative action of the target platform);
Note to Paragraph (a)(3)(xxi): The definition of “type” in this paragraph is that provided in 14 CFR §1.1.
- (xxii) Radar employing automatic target recognition (ATR) (*i.e.*, recognition of target using structural features (*e.g.*, tank versus car) of the target with system resolution better than (less than) 0.3 m);
- (xxiii) Radar that sends interceptor guidance commands or provides illumination keyed to an interceptor seeker;
- (xxiv) Radar employing waveform generation for LPI other than frequency modulated continuous wave (FMCW) with linear ramp modulation;
- (xxv) Radar that sends and receives communications;
- (xxvi) Radar that tracks or discriminates ballistic missile warhead from debris or countermeasures;
- (xxvii) Bi-static/multi-static radar that exploits greater than 125 kHz bandwidth and is lower than 2 GHz center frequency to passively detect or track using radio frequency (RF) transmissions (*e.g.*, commercial radio, television stations);
- (xxviii) Radar target generators, projectors, or simulators, specially designed for radars controlled by this category; or

(xxix) Radar and laser radar systems specially designed for defense articles in paragraph (a)(1) of USML Category IV or paragraphs (a)(5), (a)(6), or (a)(13) of USML Category VIII (MT if specially designed for rockets, space launch vehicles, missiles, drones, or unmanned aerial vehicles capable of delivering a payload of at least 500 kg to a range of at least 300 km);

Note 1 to paragraph (a)(3)(xxix): Laser radar systems embody specialized transmission, scanning, receiving, and signal processing techniques for utilization of lasers for echo ranging, direction finding, and discrimination of targets by location, radial speed, and body reflection characteristics.

Note 2 to paragraph (a)(3)(xxix): For definition of “range” as it pertains to rocket systems, see note 1 to paragraph (a) of USML Category IV.

“Payload” is the total mass that can be carried or delivered by the specified rocket, SLV, or missile that is not used to maintain flight.

Note to paragraph (a)(3): This paragraph does not control: (a) systems or equipment that require aircraft transponders in order to meet control parameters; (b) precision approach radar (PAR) equipment conforming to ICAO standards and employing electronically steerable linear (1-dimensional) arrays or mechanically positioned passive antennas; and (c) radio altimeter equipment conforming to FAA TSO C87.

* (4) Electronic Combat (*i.e.*, Electronic Warfare) systems and equipment, as follows:

(i) Electronic Support (ES) systems and equipment that search for, intercept and identify, or locate sources of intentional or unintentional electromagnetic energy specially designed to provide immediate threat detection, recognition, targeting, planning, or conduct of future operations;

Note to paragraph (a)(4)(i): ES provides tactical situational awareness, automatic cueing, targeting, electronic order of battle planning, electronic

intelligence (ELINT), communication intelligence (COMINT), or signals intelligence (SIGINT).

(ii) Systems and equipment that detect and automatically discriminate acoustic energy emanating from weapons fire (*e.g.*, gunfire, artillery, rocket propelled grenades, or other projectiles), determining location or direction of weapons fire in less than two seconds from receipt of event signal, and able to operate on-the-move (*e.g.*, operating on personnel, land vehicles, sea vessels, or aircraft while in motion); or

(iii) Systems and equipment specially designed to introduce extraneous or erroneous signals into radar, infrared based seekers, electro-optic based seekers, radio communication receivers, navigation receivers, or that otherwise hinder the reception, operation, or effectiveness of adversary electronics (*e.g.*, active or passive electronic attack, electronic countermeasure, electronic counter-countermeasure equipment, jamming, and counter jamming equipment);

*(5) Command, control, and communications (C3); command, control, communications, and computers (C4); command, control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR); and identification systems or equipment, that:

(i) Are specially designed to integrate, incorporate, network, or employ defense articles that are controlled in paragraphs or subparagraphs of the categories of §121.1 of this part that do not use the term specially designed;

(ii) Incorporate U.S. government identification friend or foe (IFF) Modes 4 or 5;

(iii) Implement active or passive ECCM used to counter acts of communication disruption (*e.g.*, radios that incorporate HAVE QUICK I/II, SINCGARS, SATURN);

(iv) Specially designed, rated, certified, or otherwise specified or described to be in compliance with U.S. government NSTISSAM TEMPEST 1–92 standards or CNSSAM TEMPEST 01–02, to implement techniques to suppress compromising emanations of information bearing signals; or

(v) Transmit voice or data signals specially designed to elude electromagnetic detection;

(6) [Reserved]

(7) Developmental electronic equipment or systems funded by the Department of Defense via contract or other funding authorization;

Note 1 to paragraph (a)(7): This paragraph does not control electronic systems or equipment (a) in production, (b) determined to be subject to the EAR via a commodity jurisdiction determination (*see* §120.4 of this subchapter), or (c) identified in the relevant Department of Defense contract or other funding authorization as being developed for both civil and military applications.

Note 2 to paragraph (a)(7): Note 1 does not apply to defense articles enumerated on the USML, whether in production or development.

Note 3 to paragraph (a)(7): This paragraph is applicable only to those contracts and funding authorizations that are dated July 1, 2015, or later.

(8) Unattended ground sensor (UGS) systems or equipment having all of the following:

- (i) Automatic target detection;
- (ii) Automatic target tracking, classification, recognition, or identification;
- (iii) Self-forming or self-healing networks; and
- (iv) Self-localization for geo-locating targets;

- (9) Electronic sensor systems or equipment for non-acoustic antisubmarine warfare (ASW) or mine warfare (*e.g.*, magnetic anomaly detectors (MAD), electric-field, electromagnetic induction);
- (10) Electronic sensor systems or equipment for detection of concealed weapons, having a standoff detection range of greater than 45 m for personnel or detection of vehicle-carried weapons, not including concealed object detection equipment operating in the frequency range from 30 GHz to 3,000 GHz and having a spatial resolution of 0.5 milliradians up to and including 1 milliradians at a standoff distance of 100 m;
- (11) Test sets specially designed for testing defense articles controlled in paragraphs (a)(3), (a)(4), (a)(5), or (b); or
- (12) Direction finding equipment for determining bearings to specific electromagnetic sources or terrain characteristics specially designed for defense articles in paragraph (a)(1) of USML Category IV or paragraphs (a)(5), (a)(6), or (a)(13) of USML Category VIII (MT if specially designed for rockets, SLVs, missiles, drones, or UAVs capable of delivering a payload of at least 500 kg to a range of at least 300 km. *See* note 2 to paragraph (a)(3)(xxix) of this category).

Note 1 to paragraph (a): The term “Low Probability of Intercept” used in this paragraph and elsewhere in this category is defined as a class of measures that disguise, delay, or prevent the interception of acoustic or electromagnetic signals. LPI techniques can involve permutations of power management, energy management, frequency variability, out-of-receiver-frequency band, low-side lobe antenna, complex waveforms, and complex scanning. LPI is also referred to as Low Probability of Intercept, Low Probability of Detection, and Low Probability of Identification.

Note 2 to paragraph (a): Paragraphs (a)(3)(xxix) and (a)(12) include terrain contour mapping equipment, scene mapping and correlation (both digital and analogue) equipment, Doppler navigation radar equipment, passive interferometer equipment, and imaging sensor equipment (both active and passive).

*(b) Electronic systems or equipment, not elsewhere enumerated in this subchapter, specially designed for intelligence purposes that collect, survey, monitor, or exploit the electromagnetic spectrum (regardless of transmission medium), or for counteracting such activities.

(c) Parts, components, accessories, attachments, and associated equipment, as follows:

(1) Application Specific Integrated Circuits (ASICs) and Programmable Logic Devices (PLD) programmed for defense articles in this subchapter;

Note 1 to paragraph (c)(1): An ASIC is an integrated circuit developed and produced for a specific application or function regardless of number of customers.

Note 2 to paragraph (c)(1): ASICs and PLDs programmed for 600 series items are controlled in ECCN 3A611.f.

Note 3 to paragraph (c)(1): Unprogrammed PLDs are not controlled by this paragraph.

(2) Printed Circuit Boards (PCBs) and populated circuit card assemblies for which the layout is specially designed for defense articles in this subchapter;

Note to paragraph (c)(2): PCBs and populated circuit card assemblies for which the layout is specially designed for 600 series items are controlled in ECCN 3A611.g.

(3) Multichip modules for which the pattern or layout is specially designed for defense articles in this subchapter;

Note to paragraph (c)(3): Multichip modules for which the pattern or layout is specially designed for 600 series items are controlled in ECCN 3A611.h.

- (4) Transmit/receive modules or transmit modules that have any two perpendicular sides, with either length d (in cm) equal to or less than 15 divided by the lowest operating frequency in GHz [$d \leq 15 \text{ cm} \cdot \text{GHz} / f_{\text{GHz}}$], with an electronically variable phase shifter or phasers that are a Monolithic Microwave Integrated Circuit (MMIC), or incorporate a MMIC or discrete RF power transistor;
- (5) High-energy storage capacitors with a repetition rate of 6 discharges or more per minute and full energy life greater than or equal to 10,000 discharges, at greater than 0.2 Amps per Joule peak current, that have any of the following:
 - (i) Volumetric energy density greater than or equal to 1.5 J/cc; or
 - (ii) Mass energy density greater than or equal to 1.3 kJ/kg;
- (6) Radio frequency circulators of any dimension equal to or less than one quarter ($1/4$) wavelength of the highest operating frequency and isolation greater than 30dB;
- (7) Polarimeter that detects and measures polarization of radio frequency signals within a single pulse;
- (8) Digital radio frequency memory (DRFM) with RF instantaneous input bandwidth greater than 400 MHz, and 4 bit or higher resolution whose output signal is a translation of the input signal (*e.g.* changes in magnitude, time, frequency) and 'specially designed' parts and components therefor;
- (9) Vacuum electronic devices, as follows:
 - (i) Multiple electron beam or sheet electron beam devices rated for operation at frequencies of 16 GHz or above, and with a saturated power output

greater than 10,000 W (70 dBm) or a maximum average power output greater than 3,000 W (65 dBm); or

(ii) Cross-field amplifiers with a gain of 15 dB to 17 dB or a duty factor greater than 5%;

(10) Antenna, and specially designed parts and components therefor, that:

(i) Employ four or more elements, electronically steer angular beams, independently steer angular nulls, create angular nulls with a null depth greater than 20 dB, and achieve a beam switching speed faster than 50 milliseconds;

(ii) Form adaptive null attenuation greater than 35 dB with convergence time less than 1 second;

(iii) Detect signals across multiple RF bands with matched left hand and right hand spiral antenna elements for determination of signal polarization; or

(iv) Determine signal angle of arrival less than two degrees (*e.g.*, interferometer antenna);

Note to paragraph (c)(10): This category does not control Traffic Collision Avoidance Systems (TCAS) equipment conforming to FAA TSO C-119c.

(11) Radomes or electromagnetic antenna windows that:

(i) Incorporate radio frequency selective surfaces;

(ii) Operate in multiple non-adjacent frequency bands for radar applications;

(iii) Incorporate a structure that is specially designed to provide ballistic protection from bullets, shrapnel, or blast;

(iv) Have a melting point greater than 1,300 °C and maintain a dielectric constant less than 6 at temperatures greater than 500 ° C;

(v) Are manufactured from ceramic materials with a dielectric constant less than 6 at any frequency from 100 MHz to 100 GHz (MT if usable in rockets,

SLVs, or missiles capable of achieving a range greater than or equal to 300 km; or if usable in drones or UAVs capable of delivering a payload of at least 500 kg to a range of at least 300 km. *See* note 2 to paragraph

(a)(3)(xxix) of this category);

(vi) Maintain structural integrity at stagnation pressures greater than 6,000 pounds per square foot; or

(vii) Withstand combined thermal shock greater than $4.184 \times 10^6 \text{ J/m}^2$ accompanied by a peak overpressure of greater than 50 kPa (MT if usable in rockets, SLVs, missiles, drones, or UAVs capable of delivering a payload of at least 500 kg to a range of at least 300 km and usable in protecting against nuclear effects (*e.g.*, Electromagnetic Pulse (EMP), X-rays, combined blast and thermal effects). *See* note 2 to paragraph (a)(3)(xxix) of this category);

(12) Underwater sensors (acoustic vector sensors, hydrophones, or transducers) or projectors, specially designed for systems controlled by paragraphs (a)(1) and (a)(2) of this category, having any of the following:

(i) A transmitting frequency below 10 kHz for sonar systems;

(ii) Sound pressure level exceeding 224 dB (reference 1 mPa at 1 m) for equipment with an operating frequency in the band from 10 kHz to 24 kHz inclusive;

(iii) Sound pressure level exceeding 235 dB (reference 1 mPa at 1 m) for equipment with an operating frequency in the band between 24 kHz and 30 kHz;

(iv) Forming beams of less than 1° on any axis and having an operating frequency of less than 100 kHz;

(v) Designed to operate with an unambiguous display range exceeding 5,120 m; or

(vi) Designed to withstand pressure during normal operation at depths exceeding 1,000 m and having transducers with any of the following:

(A) Dynamic compensation for pressure; or

(B) Incorporating other than lead zirconate titanate as the transduction element;

(13) Parts or components containing piezoelectric materials which are specially designed for underwater hardware, equipment, or systems controlled by paragraph (c)(12) of this category;

(14) Tuners specially designed for systems and equipment in paragraphs (a)(4) and (b) of this category;

(15) Electronic assemblies and components, capable of operation at temperatures in excess of 125°C and specially designed for UAVs or drones controlled by USML Category VIII, rockets, space launch vehicles (SLV), or missiles controlled by USML Category IV capable of achieving a range greater than or equal to 300 km (MT) (*see* Note 2 to paragraph (a)(3)(xxix) of this category);

(16) Hybrid (combined analogue/digital) computers specially designed for modeling, simulation, or design integration of systems enumerated in paragraphs (a)(1), (d)(1), (d)(2), (h)(1), (h)(2), (h)(4), (h)(8), and (h)(9) of USML Category IV or paragraphs (a)(5), (a)(6), or (a)(13) of USML Category VIII (MT if for rockets, SLVs, missiles, drones, or UAVs capable of delivering a payload of at least 500 kg to a range of at least 300 km or their subsystems. *See* note 2 to paragraph (a)(3)(xxix) of this category);

(17) Chaff and flare rounds specially designed for the systems and equipment described in paragraph (a)(4)(iii) of this category, and parts and components therefor containing materials controlled in USML Category V;

(18) Parts, components, or accessories specially designed for an information assurance/information security system or radio controlled in this subchapter that modify its published properties (*e.g.*, frequency range, algorithms, waveforms, CODECs, or modulation/ demodulation schemes); or

*(19) Any part, component, accessory, attachment, equipment, or system that (MT for those articles designated as such):

(i) Is classified;

(ii) Contains classified software directly related to defense articles in this subchapter or 600 series items subject to the EAR; or

(iii) Is being developed using classified information (*see* §120.10(a)(2) of this subchapter).

Note to paragraph (c)(19): “Classified” means classified pursuant to Executive Order 13526, or predecessor order, and a security classification guide developed pursuant thereto or equivalent, or to the corresponding classification rules of another government or international organization.

Note to paragraph (c)(19)(ii): Parts and components controlled by this paragraph are limited to those that store, process, or transmit classified software (*see* §121.8(f) of this subchapter).

(d) Technical data (*see* §120.10 of this subchapter) and defense services (*see* §120.9 of this subchapter) directly related to the defense articles enumerated in paragraphs (a) through (c) of this category and classified technical data directly related to items controlled in CCL ECCNs 3A611, 3B611, 3C611, and 3D611 and defense services using the classified technical data. (*See* §125.4 of this subchapter for exemptions.) (MT for technical data and defense services related to articles designated as such.)

(e)–(w) [Reserved]

(x) Commodities, software, and technology subject to the EAR (*see* §120.42 of this subchapter) used in or with defense articles controlled in this category.

Note to paragraph (x): Use of this paragraph is limited to license applications for defense articles controlled in this category where the purchase documentation includes commodities, software, or technology subject to the EAR (*see* §123.1(b) of this subchapter).

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Category XIX – Gas Turbine Engines and Associated Equipment

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(f) * * *

(7) [Reserved]

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Rose E. Gottemoeller,

Under Secretary,
Arms Control and International Security,
Department of State.

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